

### Notice of Allowability

Application No.

10/073,309

Examiner

Michael J Feely

Applicant(s)

HIRAI ET AL.

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 8/7/03.
  2. ☒ The allowed claim(s) is/are 1-18 and 20-38.
  3. ☐ The drawings filed on \_\_\_\_\_ are accepted by the Examiner.
  4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \* Certified copies not received: \_\_\_\_\_.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
    - (a) ☐ The translation of the foreign language provisional application has been received.
  6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No. \_\_\_\_\_.
  - (b) ☐ including changes required by the proposed drawing correction filed \_\_\_\_\_, which has been approved by the Examiner.
  - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet.

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

#### Attachment(s)

- |                                                                                                        |                                                                                     |
|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 1 <input type="checkbox"/> Notice of References Cited (PTO-892)                                        | 2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)          |
| 3 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                    | 4 <input checked="" type="checkbox"/> Interview Summary (PTO-413), Paper No. _____  |
| 5 <input type="checkbox"/> Information Disclosure Statements (PTO-1449), Paper No. _____               | 6 <input checked="" type="checkbox"/> Examiner's Amendment/Comment                  |
| 7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
|                                                                                                        | 9 <input type="checkbox"/> Other _____                                              |

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with William I. Solomon (Reg. No. 28,565) on November 5, 2003.

The application has been amended as follows:

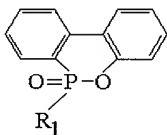
*In the Claims:*

1. (Amended) A resin composition comprising:

an epoxy resin,

an amine-type curing agent,

an organophosphorous compound having a structure represented by formula 1:



Formula 1

wherein R<sub>1</sub> is an aryl radical with two hydroxyl groups, and the aryl radical can be substituted by one to three lower alkyls, and

an organic solvent;

wherein the resin composition has been compounded at a temperature of 50°C or lower, so as to inhibit reaction of said epoxy resin and said organophosphorous compound in the resin composition during compounding.

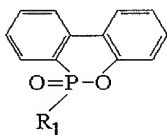
12. (Amended) A printed wiring board comprising the laminate according to claim 11, wherein an unnecessary part of the laminate has been removed by etching.

13. (Amended) A method for producing a resin composition comprising the step of compounding the following components:

an epoxy resin,

an amine-type curing agent,

an organophosphorous compound having a structure represented by formula 1:



Formula 1

wherein R<sub>1</sub> is an aryl radical with two hydroxyl groups, and the aryl radical can be substituted by one to three lower alkyls, and

an organic solvent;

wherein the compounding step is performed at a temperature of 50°C or lower, so as to inhibit reaction of said epoxy resin and said organophosphorous compound in the resin composition during compounding.

14. (Amended) A method for producing a resin composition comprising the steps of:

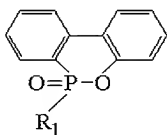
reacting an epoxy resin with an amine-type curing agent in an organic solvent at a temperature of from 80 to 140°C to form a reaction product, whereby bringing the epoxy resin

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and the amine-type curing agent into a state where they are mutually compatible in the absence of a solvent;

compounding an organophosphorous compound and said reaction product at a temperature of 50°C or lower, so as to inhibit reaction of said reaction product and said organophosphorous compound in the resin composition during compounding;

wherein said organophosphorous compound has a structure represented by formula 1:



Formula 1

wherein R<sub>1</sub> is an aryl radical with two hydroxyl groups, and the aryl radical can be substituted by one to three lower alkyls.

Cancel claim 19

20. (Amended) The resin composition according to claim 1, wherein the reaction of said epoxy resin and said organophosphorous compound is inhibited such that a ratio of amount of organophosphorous compound that has reacted with the epoxy resin to the amount of unreacted organophosphorous compound is at most 0.5%.

37. (Amended) A printed wiring board comprising the laminate according to claim 36, wherein an unnecessary part of the laminate has been removed by etching.

*Allowable Subject Matter*

2. Claims 1-18 and 20-38 are allowed.
3. The following is an examiner's statement of reasons for allowance:

There are three independent embodiments of the instant invention: *1)* the composition set forth in claim 1; *2)* the method for producing a composition set forth in claim 13; and *3)* the method for producing a composition set forth in claim 14. For all these embodiments, Sagara et al. (US Pat. No. 6,524,709) is the closest prior art.

*Claim 1:* Sagara et al. appear to initially mix (compound) an epoxy component and an organophosphorous component at a low temperature prior to heating the mixture to an elevated *reaction* temperature; however, the reference does not teach compounding all four of the claimed ingredients together at a temperature of 50°C or lower, wherein the reaction of the epoxy and the organophosphorous compound is inhibited. Sagara et al. optionally add a curing agent after the elevated *reaction* temperature (100-200°C) is achieved, and a solvent is later added to adjust the viscosity of the reaction product.

Although the claim is written using product-by-process language, the compounding step is critical to the instant invention because it is performed while inhibiting the reaction of the epoxy component and the organophosphorous compound. The prior art fails to teach or suggest a compounded mixture of: an epoxy resin, an amine-type curing agent, an organophosphorous compound of Formula 1, and an organic solvent; wherein the reaction of the epoxy compound and the organophosphorous compound has been inhibited during compounding.

*Claim 13:* As set forth above, Sagara et al. fail to teach or suggest a method wherein all four ingredients are compounded together at a temperature of 50°C or lower, wherein the reaction of the epoxy and the organophosphorous is inhibited during the compounding step.

*Claim 14:* Sagara et al. fail to teach or suggest a method wherein an epoxy resin is reacted with an amine curing agent in an organic solvent, followed by compounding the resulting reaction product with an organophosphorous compound at a temperature of 50°C or lower, wherein the reaction of the reaction product and the organophosphorous compound is inhibited during the compounding step. Sagara et al. reacts the epoxy component with the organophosphorous compound at an elevated temperature in the optional presence of an amine catalyst. This reaction product is then diluted with a solvent.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

#### ***Communication***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Feely whose telephone number is 703-305-0268. The examiner can normally be reached on M-F 8:30 to 5:00.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

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A handwritten signature in black ink, reading "Robert A. Dawson". The signature is fluid and cursive, with the first name "Robert" and last name "Dawson" clearly legible.

Robert Dawson  
Supervisory Patent Examiner  
Technology Center 1700

Michael J. Feely  
Patent Examiner  
Art Unit 1712

November 6, 2003